REMARKS

Applicants thank the Examiner for the telephone conversation of November 1, 2005 with their undersigned representative.

Prior to this amendment, claims 1 and 3-48 where pending. Applicants have amended claim 47, cancelled claim 48, and added new claims 49-79. Accordingly, claims 1, 3-47, and 49-79 are presented for examination.

Applicants have filed an information disclosure statement concurrently with this amendment.

Claim Rejections – 35 U.S.C. § 112

The Office Action rejected claim 47 for failing to comply with the written description requirement. Applicants have amended claim 47 to recite "oxide glass" rather than "non-chalcogenide glass." The Office Action acknowledges that "the specification has support for a second glass as an oxide glass" (Office Action, page 5, section 4). Accordingly, applicants submit that claim 47, as amended, satisfies the written description requirement and ask that the rejection under 35 U.S.C. § 112 be withdrawn.

Claim Rejections – 35 U.S.C. § 103

Independent claim 1

The Office Action maintained the rejection of claims 1, 3-12, 17-21, 25-33, and 35 as being allegedly unpatentable over Katsuyama (EP 0 060 085 B1) in view of Ellison (U.S. Patent No. 6,542,690).

In responding to applicants arguments, the Office Action states:

> While the examiner acknowledges Katsuyama teaches solving problems dealing with impurities, the impurities are directed to those associated within the starting material rather [than] the impurities developed during the reaction. Therefore, while Katsuyama teaches of solving a problem of impurities in the starting material, Ellison is directed to solving the problem of impurities associated with the reaction of the precursor materials. Therefore one of ordinary skill in the art, taking the references collectively, would be motivated to modify Katsuyama to utilize the PECVD method as taught by Ellison to alleviate the problem of unwanted decomposition of reactant materials. (Office Action, Detailed Action, Sec. 2)

We disagree, however, that a person of ordinary skill in the art would have combined the teachings of the two references, as argued in the Office Action.

Ellison addresses a problem that is not relevant to the methods or objectives disclosed by Katsuyama. Ellison is concerned with identifying "novel compositions and novel manufacturing processes" for doping a silica fiber in order to raise the refractive index of the silica glass (see, e.g., Ellison, col. 1, lines 8-12, col. 2, lines 42-63). Ellison identifies chalcogenide elements as dopants for "novel compositions" that increase the refractive index of silica (id., col. 2, lines 49-64, and col. 3, lines 8-16).

According to Ellison, "conventional techniques [for forming a core-clad glass optical waveguide] utilized a flame hydrolysis process that typically caused unwanted decomposition of reactant materials, leading to byproducts or physical defects in the nascent glass article. We have discovered that plasma enhanced chemical vapor deposition (PEVCD) eliminates these problems and allows incorporation of previously unavailable materials, in particular chalcogenide elements" (id., col. 3, lines 38-45). In other words, the "unwanted decomposition of reactant materials" that the Office Action refers to are the result of trying to incorporate various dopant materials into the silica glass using conventional deposition methods.

The problems addressed by Katsuyama, on the other hand, are the result of using non-CVD methods to form chalcogenide optical waveguides (Katsuyama, col. 2, lines 18-25). Katsuyama addresses these problems, including the problem of contaminants associated with the raw materials, by using thermal CVD (id., col. 2, lines 29-54). By the Examiner's own admission, the contaminants discussed by Katsuyama are not the same as the "impurities developed during the reaction" addressed by Ellison (Office Action, Detailed Action, Sec. 2). The problem and solution identified by Ellison are a result of Ellison trying to increase the refractive index of silica. This is not relevant to the methods and objectives of Katsuyama. Thus, a person of ordinary skill in the art would have no reason to look to Ellison's teachings when trying to achieve the objectives set forth by Katsuyama.

Moreover, there is no indication that "impurities developed during the reaction" are an issue in Katsuyama's methods. There is certainly no mention of such impurities in Katsuyama. Nor would a person of ordinary skill expect the impurities addressed by Ellison to be an issue in

Katsuyama's methods because Katsuyama is not trying to dope silica with a chalcogenide element.

In fact, according to Katsuyama, his methods produce "infrared optical fiber of high performance ... without any fear of contamination of impurities." (id., col. 2, lines 55-61.) Thus, based on Katsuyama's own disclosure, there is no motivation for a person of ordinary skill in the art to modify Katsuyama's methods to reduce impurities, let alone modify Katsuyama's methods based on Ellison's teachings.

Applicants stress that the Office Action has failed to show where in the prior art exist motivation for a person of ordinary skill to modify the thermal CVD techniques for making chalcogenide waveguides disclosed by Katsyama to include the plasma CVD methods for doping a silica waveguide disclosed by Ellison. Applicants reiterate that the only teaching of methods that include "exposing a surface to a first gas composition under conditions sufficient to deposit a layer of a first chalcogenide glass on the surface, wherein exposing the surface to the first gas composition comprises activating a plasma in the first gas composition" comes from their own specification and the rejection of claim 1 over Katsuyama in view of Ellison constitutes impermissible hindsight. Accordingly, applicants submit that claim 1 is not obvious in view of Katsuyama and Ellison. Applicants ask that the prior art rejection of claim 1 be withdrawn.

Claims 3-12, 17-21, 25-33, and 35 depend either directly or indirectly from independent claim 36 and should be patentable over Katsuyama and Ellison for at least the same reasons as set forth above for claim 36. Applicants ask, therefore, that the prior art rejection of claims 37-41 and 44-46 be withdrawn.

The Office Action also rejected claims 13-16 and 22-24 as being allegedly unpatentable over Katsuyama in view of Ellison and further in view of Aslami (U.S. Patent No. 4,212,663). Claims 13-16 and 22-24 depend either directly or indirectly from independent claim 1 and should be patentable for at least those reasons set forth above with respect to claim 1. Accordingly, applicants ask that the prior art rejection of claims 13-16 and 22-24 be withdrawn.

The Office Action also rejected claim 34 as being allegedly unpatentable over Katsuyama in view of Ellison and further in view of Francis et al. (U.S. Patent No. 5,609,660). Claim 34 depends indirectly from independent claim 1 and should be patentable for at least those reasons

set forth above with respect to claim 1. Accordingly, applicants ask that the prior art rejection of claim 34 be withdrawn.

Independent claim 36

The Office Action also rejected claims 36-41 and 44-46 as being allegedly unpatentable over Katsuyama in view of Ellison.

However, as discussed in the telephone conversation of November 1, 2005, neither Katsuyama nor Ellison, either alone or in combination, disclose or suggest methods that include "exposing the first gas composition to conditions sufficient to change the first compound into a second compound to deposit a layer of a second material on the inner surface of the tube, wherein the second compound adversely reacts with the first material to form undesired impurities on the inner surface of the tube and the introduction of the first gas composition reduces the undesired impurities on the inner surface relative the introduction of a gas composition including the second compound" as required by claim 36. Nor does the Office Action indicate that such a disclosure or suggestion exist in Katsuyama or Ellison. Accordingly, applicants submit that claim 36, as amended, is patentable over Katsuyama in view of Ellison, and applicants ask that the prior art rejection of claim 36 be withdrawn.

Claims 37-41 and 44-46 depend either directly or indirectly from independent claim 36 and should be patentable over Katsuyama and Ellison for at least the same reasons as set forth above for claim 36. Applicants ask, therefore, that the prior art rejection of claims 37-41 and 44-46 be withdrawn.

The Office Action also rejected claims 42 and 43 as being allegedly unpatentable over EP Katsuyama in view of Ellison and further in view of EP '273 (EP 955273). Claims 42 and 43 depend directly and indirectly, respectively, from independent claim 36 and should be patentable for at least those reasons set forth above with respect to claim 36. Accordingly, applicants ask that the prior art rejection of claims 42 and 43 be withdrawn.

Independent claim 47

The Office Action also rejected claim 47 as being allegedly unpatentable over Katsuyama in view of Ellison.

Among other limitations, claim 47 requires "exposing [a] layer of [a] first chalcogenide glass to a second gas composition under conditions sufficient to deposit a layer of a second glass on the layer of the first chalcogenide glass, wherein the second glass is an oxide glass."

In dismissing the arguments set forth in applicants response to the Office Action mailed February 9, 2005, the Office Action states:

> [w]hile Katsuyama teaches of depositing a chalcogenide onto another glass, Katsuyama also teaches of depositing two layers of chalcogenide. However, because Ellison discloses in the abstract that chalcogenide glass has a higher refractive index than oxide glass and at col. 9, lines 49-54 that some of the inner layers may have higher refractive indexes than smaller radius layers. Taking the references collectively, it would have been obvious to have deposited an oxide glass having lower refractive index as one of the inner layers after depositing the higher refractive index chalcogenide glass. (Office Action, Detailed Action, Sec. 2)

It is not clear how structures having a lower refractive glass as inner layers relative to a higher refractive index glass, as disclosed by Ellison, are relevant to the structures disclosed by Katsuyama. Katsuyama is concerned with two different types of waveguide. The first are optical fibers where "the core is made from a material of higher refractive index than is the clad surrounding the core to utilize total internal reflection at the interface between the core and the clad to transmit beams" (Katsuyama, co. 1, lines 36-41). The second are "obtained from making the clad from chalcogenide glass of high refractive index and high infrared transmittance while using air as the core" (id., col. 3, lines 11-15). Nowhere does Katsuyama disclose or suggest that either structure includes a lower refractive index glass layer at a smaller radius in the structure than a higher refractive index glass layer. Thus, applicants submit that the disclosure in Ellison identified by in the Office Action would not motivate a person of ordinary skill in the art to modify Katsuyama's methods to include "exposing [a] layer of [a] first chalcogenide glass to a second gas composition under conditions sufficient to deposit a layer of [an oxide] glass on the layer of the first chalcogenide glass," as required by claim 47.

Nor is there any motivation to modify Ellison's methods based on the disclosure of Katsuyama to provide a method that includes "exposing [a] layer of [a] first chalcogenide glass to a second gas composition under conditions sufficient to deposit a layer of [an oxide] glass on the layer of the first chalcogenide glass." As discussed above, Ellison is concerned with doping

an oxide glass with a *chalcogenide element* to increase the refractive index of the material. While the portion of Ellison's disclosure identified in the Office Action refers to forming a lower index band within a higher index band, it is still in the context of doping silica-based oxide glass, and has nothing whatsoever to do with chalcogenide glasses (Ellison, col. 9, lines 49-54) (see, e.g., Fundamentals of Inorganic Glasses, pages 4-7, Academic Press, Inc. (1994), included in information disclosure statement accompanying this amendment).

Furthermore, there is no reasonable expectation in the prior art that a person could successfully modify the methods of Ellison or Katsuyama as suggested by the Office Action. Applicants note, for example, that " *where an oxide glass is being deposited onto a layer of a chalcogenide glass, gaseous oxygen can oxidize the chalcogenide glass*" thereby introducing "impurities into [a] preform, which can be detrimental to fiber performance" (Emphasis added) (Applicants Specification, page 26, lines 5-9). Thus, even assuming for arguments sake that a person of ordinary skill was motivated to modify the methods of Katsuyama or Ellison to include "exposing [a] layer of [a] first chalcogenide glass to a second gas composition under conditions sufficient to deposit a layer of [an oxide] glass on the layer of the first chalcogenide glass" there is no reasonable expectation that they would succeed and still achieve the objectives set forth in Katsuyama or Ellison.

Therefore, for at least those reasons set forth above, applicants submit that claim 47 is patentable over the combination of Katsuyama and Ellison, and applicants ask that the prior art rejection of claim 47 be withdrawn.

New Claims

Applicants have added new claims 49-79.

Support for new claims 49-51, 63, 69, and 70 can be found in applicants specification at page 11, lines 1-9, for example.

Support for new claims 52 and 64 can be found in applicants specification at page 24, lines 4-6, for example.

Support for new claims 53, 54, 65, 66, 71, and 72 can be found in applicants specification at page 3, lines 10-27 and page 4, lines 10-17, for example.

Support for new claims 55 and 73 can be found in applicants specification at page 12, line 21-22, for example.

Support for new claims 56, 57, 67, 68, and 74 can be found in applicants specification at page 18, lines 25-30, for example.

Support for new claims 58-60 and 75-77, can be found in applicants specification at page 26, line 30 – page 27, line 7, for example.

Support for new claim 61 can be found in applicants specification at page 26, lines 19-24, for example.

Support for new claim 62 can be found in applicants specification at page 12, line 30, and Fig. 2, for example.

Support for new claims 78 and 79 can be found in applicants specification at page 7, lines 14-16, for example.

New claims 49-79 all depend either directly or indirectly from independent claims 1, 36, or 47. Accordingly, new claims 49-79 should be patentable over the prior art of record for at least the same reasons as presented above with respect to independent claims 1, 36, and 47.

Conclusion

Applicants submit that all claims are in condition for allowance, which action is requested. Enclosed is a $775 check for excess claim fees and a $60 check for the Petition for Extension of Time fee. Please apply any other charges or credits to deposit account 06-1050, referencing Attorney Docket No. 13445-026001.

Respectfully submitted,

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